8 LIGHTING AND APPLIANCES

This section presents the findings on lighting characteristics and the penetration of efficient appliances.

8.1 LIGHTING

LIGHTING

About 34 hardwired light fixtures were installed per home, showing an increase over the 25 fixtures per home from the 1995 baseline. The greater number of fixtures could be partially related to the increase in house size from the earlier study to the current one, although the increase in the number of fixtures is proportionally much larger than the increase in house size, indicating that other factors may be influencing the number of fixtures installed. Vermont Star Home and utility program participants had a slightly higher number of total fixtures (36) than nonparticipants (33).

For all the surveyed homes, about 8% of the fixtures contained compact fluorescent and 6% other fluorescent lamps. This result shows an improvement over the 1995 baseline study, which indicated that 5% of the fixtures were compact fluorescent and 4% were other fluorescents.

The Vermont Star Homes and utility programs were clearly a driver in promoting the installation of fixtures with compact fluorescent lamps. Participation in the Vermont Star Homes program and other utility programs increased the penetration of fixtures with compact fluorescent to 16%, whereas nonparticipating homes achieved an installation rate of only 4%. The penetration of other nonincandescent lighting was approximately the same between the two groups.

Table 8.1: Penetration of Light Fixtures by Lamp Type

	All Survey Respondents		Vermont Star Home and Utility Program Participants		Non Program Participants	
Type of Fixture	#	%	#	%	#	%
Incandescent	4,212	79%	1,278	72%	2,934	83%
Compact fluorescent	438	8%	286	16%	152	4%
Other fluorescent	313	6%	131	7%	185	5%
Low Volt Halogen	190	4%	60	3%	130	4%
Other Halogen	129	2%	28	2%	101	3%
High pressure sodium	5	0%	0	0%	5	0%
Other	23	0%	1	0%	22	1%
Total	5,310		1,784		3,529	

Slightly under half of the homes in the survey installed one or more fixtures with compact fluorescent lamps, as compared to about one-third of the survey respondents of the 1995 study. Program participants were much more likely to install at least one CFL fixture (80% as compared to 31%) and tended to install more CFL fixtures per home than the survey respondents as a whole. About 70% of nonparticipants did not install a single fixture with CFL lamps.

Table 8.2: Distribution of Efficient Fixture per Home

# of CFL	All Survey Participants		Program Participants		Nonparticipants	
Fixtures	# of Homes	%	# of Homes	%	# of Homes	%
0	84	53%	10	20%	74	69%
1to 3	37	23%	15	30%	22	20%
4 to 6	14	9%	6	12%	8	7%
7to 9	10	6%	9	18%	1	1%
10 to15	9	6%	8	16%	1	1%
More than16	4	3%	2	4%	2	2%
n	158		50		108	
Min	0		0		0	
Max	36		36		33	

Overall survey results indicate that CFL fixtures were located fairly equally in likely high use and low use locations.[1] Program participants, however, showed a greater tendency to place CFL fixtures in high use locations (43% of CFL fixtures in high use sites, as compared to 32% in low use areas), whereas nonparticipants were more likely to place CFL fixtures in low use locations (24% in high and 32% in low use areas).

Approximately 7% of exterior light fixtures contained CFL lamps. This percentage is reasonably consistent between program participants and nonparticipants.

PLUG LOAD LIGHTING

On average, the surveyed homes had 8 plug load lamps, and 4% contained CFL bulbs. The saturation of CFL technology in plug load lighting was similar in the homes of program participants and nonparticipants. These lamps were generally located in high use locations for both groups.

8.2 ENERGY STAR APPLIANCES

APPLIANCES AND AIR CONDITIONING

[1] High use locations were defined as kitchen, living room and family room, and low use sites were halls and bathrooms.

The saturation of Energy Star appliances was high, with 47% of clothes washers, 36% of dishwashers and 27% of refrigerators verified as meeting the Energy Star criteria. Table 8.3 below provides the details of Energy Star appliance saturation for efficiency program for all survey respondents.

Table 8.3: Saturation of Energy Star Appliances

Appliance	Total	# New	# Valid Model Numbers	# Estar	% Estar
Refrigerator	178	150	140	38	27%
Clothes washer	156	101	87	41	47%
Dishwasher	143	130	116	42	36%
Total # of site visits	159				

Dishwashers and refrigerators were most commonly purchased for the new home. Freezers were the most likely to be moved from the previous home, and many of these freezers were quite advanced in years, some over 30 years old. Moved refrigerators also tended to be older models, having a median age of 10 years.

Table 8.4 below shows the difference in saturation rates between efficiency program participants and nonparticipants. The saturation of Energy Star dishwashers in participating homes is markedly higher than nonparticipating homes (49% as compared to 31%). This difference is significant at the 5% level. For clothes washers, participating homes were somewhat more likely to have an Energy star model (56% to 42%), and this increase in saturation is significant at the 10% level. For refrigerators, there was no significant difference between participating and nonparticipating homes.

Table 8.4: Saturation of Energy Star Appliances for Participants and Nonparticipants of Efficiency Programs

	All Homes		Nonprogram Participants		Program Participants	
Appliance	# homes[2]	% homes w/Estar	# homes	% homes w/Estar	# homes	% homes w/Estar
Refrigerator	140	27%	98	26%	42	31%
Clothes washer	87	47%	55	42%	32	56%
Dish washer	116	36%	81	31%	35	49%

[2] Number of homes is the number with valid appliance model numbers.

8.3 OTHER APPLIANCES

OTHER APPLIANCES

The vast majority of homes had clothes dryers, and 33% of these appliances used propane or natural gas. In comparison to the 22% of the gas dryer hookups from the 1995 study, this result shows an increase of new homes with non-electric dryers. Gas was the preferred fuel for cooking stoves (57% of homes).

About 15% of the homeowners reported using room air conditioners, and 6% of the homes were built with central air conditioning. The homes with central air conditioning were geographically dispersed throughout the southern, central and northwestern sections of the state.

Hot tubs were as common as central air conditioning, with 10 homes installing hot tubs and a substantial majority (80%) fueled by electricity.

Dehumidifiers were installed in 7% of the homes. Only 2 homes had pools.

Table 8.5: Distribution of Other Appliances

	# homes	% homes	# Items	Electric	Fossil fuel	% Elec
Room A/C	24	15%	32			
Central A/C	10	6%	10			
Hot Tubs	10	6%	10	8	2	80%
Clothes dryer	153	96%	153	103	50	67%
Cooking Stoves	156	98%	156	67	89	43%
Dehumidifiers	11	7%	11			
Pool Pump	2	1%	2			

Ceiling fans are a popular addition to new homes, with 103 homes (65%) of the sample containing at least one, and 43 of the 103 homes containing three or more. A total of 258 ceiling fans were installed in the 103 homes.